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Delineation of geographic markets for fed cattle

Abstract

Determining the extent of geographic markets for fed cattle is important for monitoring performance of the industry. The ability of packing plants to influence prices is determined in part by their ability to segment the market for fed cattle and isolate themselves from plants in other regions. This study analyzed transaction data from 43 U.S. steer and heifer slaughter plants collected by the Grain Inspection Packers and Stockyards Program for approximately a 1-year period during 1992-93. Beef packers procured an average of 64% of their cattle within 75 miles of packing plants, 82 % within 150 miles, and 92% within 250 miles. However, these average distances varied by region of the U.S. Prices were linked strongly across plants, suggesting a national market for fed cattle. This indicates that local measures of packing plant concentration overstate the degree of concentration among potential cattle buyers in the region.

Keywords

Cattlemen's Day, 1997; Kansas Agricultural Experiment Station contribution; no. 97-309-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 783; Beef; Geographic markets for cattle; Beef packers; Packer concentration

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DELINEATION OF GEOGRAPHIC MARKETS FOR FED CATTLE

T. C. Schroeder¹

Summary

Determining the extent of geographic markets for fed cattle is important for monitoring performance of the industry. The ability of packing plants to influence prices is determined in part by their ability to segment the market for fed cattle and isolate themselves from plants in other regions. This study analyzed transaction data from 43 U.S. steer and heifer slaughter plants collected by the Grain Inspection Packers and Stockyards Program for approximately a 1-year period during 1992-93. Beef packers procured an average of 64% of their cattle within 75 miles of packing plants, 82 % within 150 miles, and 92% within 250 miles. However, these average distances varied by region of the U.S. Prices were linked strongly across plants, suggesting a national market for fed cattle. This indicates that local measures of packing plant concentration overstate the degree of concentration among potential cattle buyers in the region.

(Key Words: Geographic Markets for Cattle, Beef Packers, Packer Concentration.)

Introduction

Determining relevant geographic procurement markets for fed cattle is essential in monitoring market behavior and assessing the industry's structure and performance. Market boundaries identify separate economic markets within which firms or plants operate independent of firms or plants located in other regions. Beef packing is highly con-

centrated; the top four firms accounted for 81.1% of 1995 commercial steer and heifer slaughter. In many states beef packing by these four firms exceeds 90%. Therefore, determining the extent to which plants in a region compete for cattle purchases with plants located in other regions is an important determinant of whether plants in local areas can unduly influence fed cattle price. The purpose of this study was to determine the relevant geographic procurement markets for fed cattle in the U.S.

Experimental Procedures

Data were collected by the Grain Inspection Packers and Stockyards Administration (GIPSA) on individual transactions for all pens of cattle of 35 head or more slaughtered by 43 U.S. fed cattle slaughter plants from early April 1992 through early April 1993. Plants from the states of Kansas, Texas, Colorado, Nebraska, Iowa, Minnesota, Arizona, California, Utah, Washington, Idaho, Illinois, Michigan, Pennsylvania, and Wisconsin were represented. The transaction price data were analyzed for several aspects including examination of geographic source of cattle purchased and regression analysis of how prices at each plant responded to price changes at other plants over time. As a result of numerous missing data and inconsistencies in data reporting, the data set analyzed by regression consisted of 103,442 pens of cattle slaughtered in 28 of the 43 plants. Prior to making comparisons across plants, all price data were adjusted for differences in sex, quality, and pen characteristics.

Results and Discussion

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Table 1 shows the percentages of cattle purchased with in various distances from plants. Plants located in Kansas and Texas (MidSouth) bought 76% of their cattle within a 75-mile radius. This is the largest percentage of cattle purchased within that distance of any region and makes sense given the concentration of cattle feeding in this region. This contrasts with plants in Eastern states that purchased only 32% of their slaughter needs within 75 miles. Plants located in Kansas and Texas purchased 95% of their cattle within 250 miles. The maximum distance cattle were hauled by a plant was 1140 miles, and nine plants hauled at least some cattle in excess of 900 miles. Cattle procurement areas for many of the plants analyzed showed considerable overlap. Some plants had more than 15 other plants (of the 43 in the study) that purchased cattle from the same counties where they purchased 10% or more of their cattle. Significant procurement overlaps were most common for plants located in MidSouth and MidNorth states. Procurement overlaps help ensure that plants compete with each other for fed cattle.

Table 1. Regional Procurement Areas for Fed Cattle Slaughter Plant

Region ^a	Avg Percent of Cattle Procured within Indicated Miles of Plants		
	75 miles	150 miles	250 miles
West	72.05%	90.46%	93.20%
East	31.88%	52.24%	78.06%
MidNorth	64.94%	83.93%	94.65%
MidSouth	76.42%	90.84%	95.29%

^aWest includes plants in Arizona, California, Utah, Washington, and Idaho; East includes plants in Illinois, Wisconsin, Michigan, Pennsylvania, and Illinois; MidNorth includes plants in Nebraska, Colorado, Iowa, and Minnesota; MidSouth includes plants in Texas and Kansas. Source: Hayenga et al. in M.L. Hayenga, S.R. Koontz, and T.C. Schroeder. *Definition of Regional Cattle Procurement*

Prices across plants were related closely. During the time period studied, prices across plants did not diverge from each other, suggesting that these plants were competing for cattle in linked markets. Fed cattle prices at different plants are related, because producers sell cattle to the plant offering the highest price, forcing plants to compete with each other for cattle. Strength of price relationships declined as distance between plants increased because of increased costs and risks of shipping cattle. The larger the overlapping trade areas shared by plants, the more closely their prices related to each other and the more quickly they responded to each other. Plants in close proximity or with significant procurement overlap are forced to offer prices competitive with other plants, if they are going to purchase sufficient numbers of cattle.

Plants that purchased more of their cattle in the cash market tended to react more to price changes at other plants than those that procured cattle through contracts or that fed their own cattle. This suggests that plants that use means other than cash purchases to secure cattle may not be as responsive to price changes at other plants. Smaller plants tend to have prices that were linked more closely to other plants' prices. Finally, plants owned by the same firm tended to have stronger and quicker price responses to each other than to plants owned by different firms. This is because information flow and ability to coordinate cattle purchases across location are greater for plants owned by the same parent firm.

Overall, results suggested that fed-cattle prices across the U.S. are linked strongly. Prices at plants in the core cattle feeding regions are tied very closely to each other, because competition forces plants to change prices in accordance to other plants' prices in the area. Because no regions can isolate themselves from competition by plants in other regions and because information flows rapidly, cattle trading tends to be in a national market. This suggests that local measures of packer concentration overstate the level of actual concentration on a national basis.